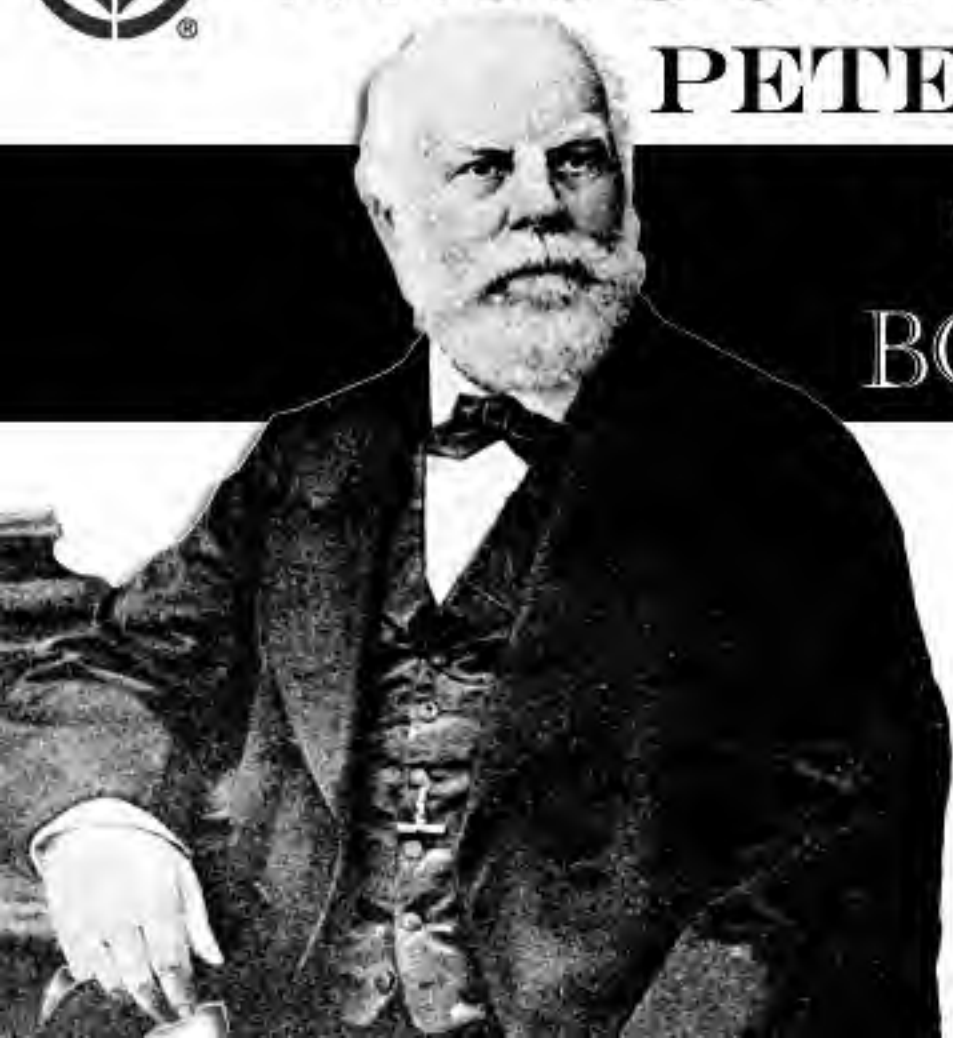




MISSOURI BOTANICAL GARDEN  
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BOTANICAL NOTEBOOKS

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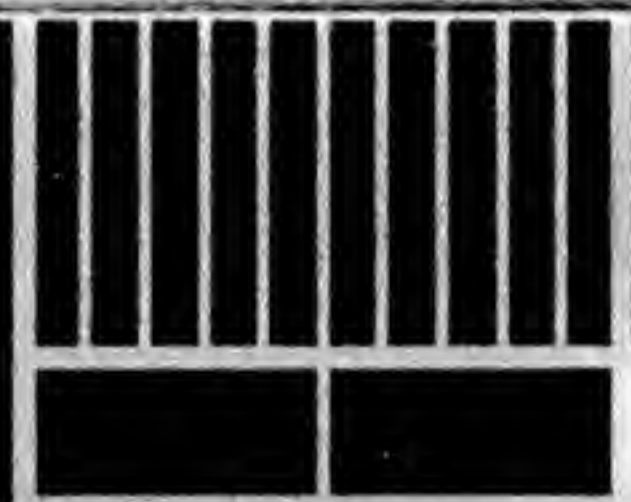
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Pani Apr 7 1869

South American ovate Opuntia allied to the clavate ones

- O. floccosa* S. <sup>1845</sup> ~~larger~~ plant } both formerly united as *O. involuta* Hort.  
*O. vestita* S. ~~smaller~~ plant }  
*O. Turpinii* with spines  
*O. calva* , probably the same without spines. Red Brittle strongly bearded (at Herndrop)  
*O. diademata*, white pilose spines pointed, points bearded! Brittle stout  
*O. phyllanthoides* (similar, spines brown - Brittle " at Herndrop  
" *calva*, only the name)  
*O. platyacantha*  
*O. clavavides*  
*O. Verschaffeltii*

*O. Calva* Lemaire is said to be a form  
of *O. Turpinii* Lem. see Lab. 484



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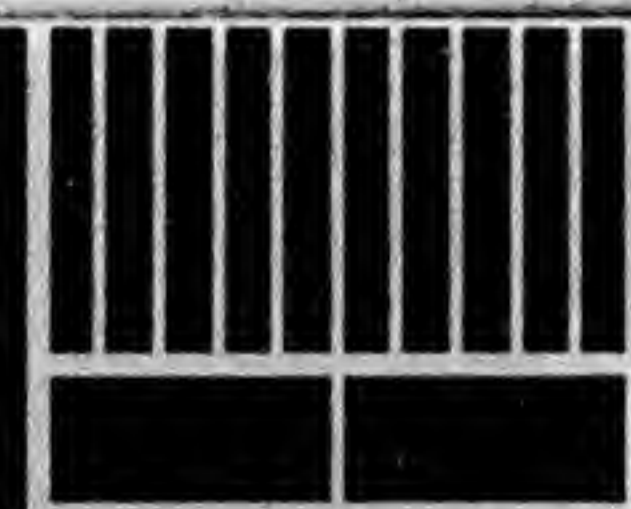
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Opuntia

Hort. Kew

Aug

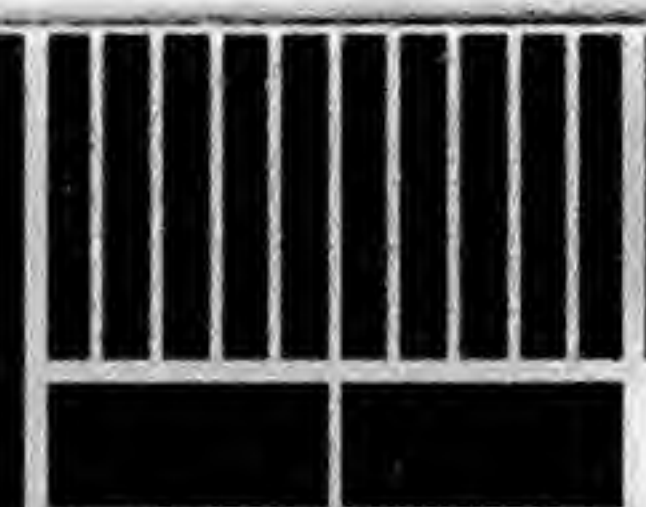
1857

Euph. miss

Pereskia subulata

leaves, often 4 inches

long; stout yellow spines 4-6  
in number, 1-3 inches long  
are seen on the older parts of the  
plant in thick gray wool; tubercles  
flattened, rhomboid.



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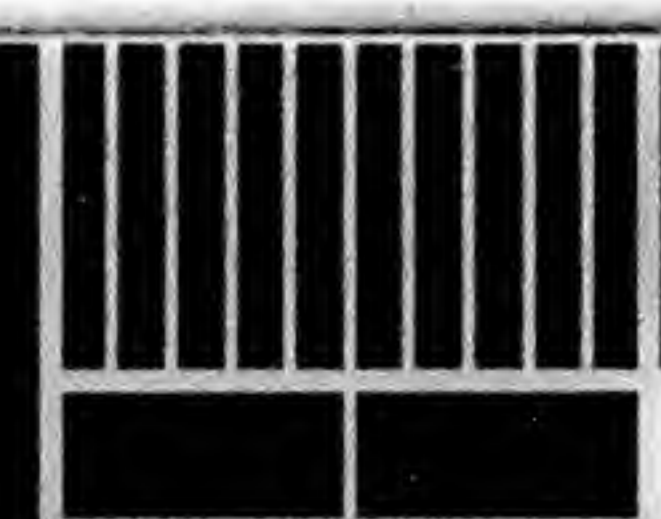
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*Opuntia subulata*

[illegible]

Further and the most essential character of *Opuntia* is found in the expansion of the perianth which envelopes the ovulum and finally forms a long whitest coating of the seed, which if it was softer we would call an arillus. This I first discovered in an otherwise incomplete specimen of our plant kindly sent several years ago by Prof. Tuckerm. of Palermo and I find it ~~the same~~ again in the flower now under inspection. This character is also peculiar to *Opuntia* and does not occur in any other Cactus. Perisperm on the other hand has the smooth surface and the dark colored <sup>in the flesh</sup> crust.

seeds, distinct of the long awl-like, of all other *Opuntia*.

F The <sup>subglossate, slightly pyramidal</sup> ovary of *Opuntia subulata* is ~~perianth~~ <sup>about 3 inches long</sup> in very species and is covered with about 20 obovate or rhombic obovate <sup>depressed</sup> tubercles, which bear below the top ~~the~~ <sup>at least</sup> ~~thick~~ <sup>subulata</sup>, suberect <sup>at least</sup> ~~sepal~~ <sup>sepal</sup> of  $1\frac{1}{2}$  to 2 inches ~~in length~~ and in the axils (in the notch of the tubercle) a woolly woolly rarely with a few bristles. The numerous <sup>small</sup> apparently purple petals are obovate to orbicular, the slender stamens 5 in number. ~~Stamens of lower order seen.~~

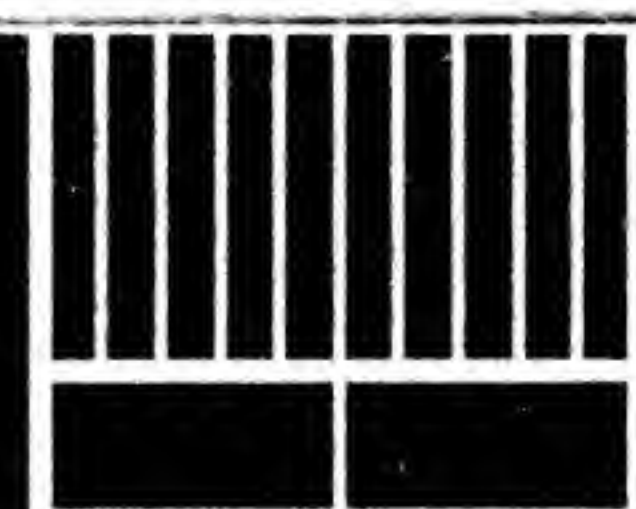
The species is native as we learn of *Chiti*, is evidently closely allied to <sup>well known</sup> *C. cylindrica* also of the Coast of North America, and must be classed with the *Cylindrica Opuntia* (but it <sup>is</sup> ~~is~~ <sup>very</sup> ~~very~~ <sup>different</sup>) from the northern *Cylindrica* <sup>N. A. p. 9.</sup> *Opuntia* from Mexico and Arizona with their terrible shortened species (e.g. *O. tinctoria*, *inabritata*, *arborescens* etc.).

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probably all "*Pirouia*" with *tinctoria* leaves.

F The leaves being somewhat persistent <sup>belong to Opuntia</sup> in *subulata* have probably ~~been~~ <sup>been</sup> the cause of the plant being referred to *Pirouia*, before now for which known. But in other less persistent leaves are not rare in *tinctoria*, *cylindrica* and others, and subulata leaves are not found in any true *Pirouia*. Their size, 3-5 inches in length exceeds that of <sup>only</sup> ~~any~~ other known *Opuntia*.

The fruit seen was 4 in long by a  $2\frac{1}{4}$  The upwards <sup>contours of</sup> the obovate tubercles still distinct but cut off flat, apex of the upper short sepals still attached, umbels narrow and very deep - 12 large seeds densely packed. The seeds are altogether the largest. *Opuntia* seeds are by long <sup>about</sup> 5-6 <sup>times</sup> longer than broad of very irregularly angled and pointed.



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~~to~~ and quite thick, not flat like as Opuntia seeds  
commonly are. A very narrow ~~short~~ <sup>long</sup> ~~linear~~ <sup>lanceolate</sup>  
commissure joins the seed, ~~the~~ <sup>the</sup> ~~extending~~ <sup>extending</sup>  
the ~~extending~~ <sup>extending</sup> part of the ~~fruit~~ <sup>seed</sup>. Albumen very scant, embryo  
with cotyledons parallel to the middle, as is usual in Opuntia.  
Our plant is closely allied to the *Cylindropuntia* <sup>white</sup> ~~also~~ <sup>like</sup>  
ones from the west coast of S. America.

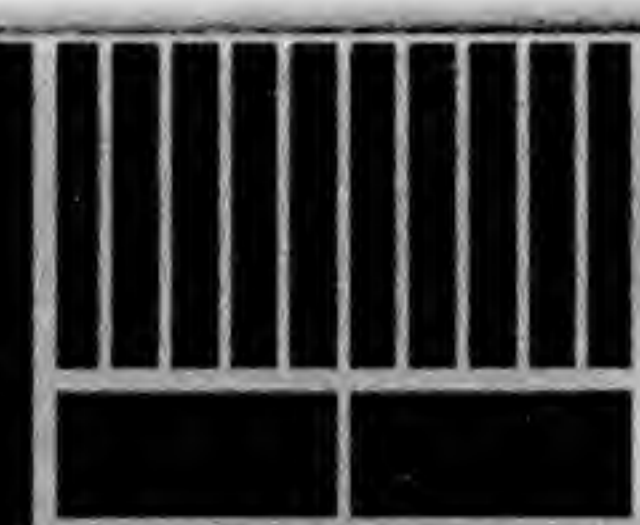
The *Cylindropuntia* differ very materially from the  
common flat jointed *Platysperma*, not only by their  
~~more~~ <sup>more</sup> ~~of~~ <sup>of</sup> ~~greater~~ <sup>greater</sup> extent, but also by character of the  
seed. They ~~which~~ <sup>which</sup> is distinct of the *Opuntia* <sup>may</sup> <sup>be</sup>  
~~I find~~ <sup>I find</sup> commissure of the *Platysperma*. They form

3 very natural sections

1. *Ternstroemia* species ~~scarcely~~ <sup>scarcely</sup> ~~forming~~ <sup>forming</sup> a very  
oppressive, the larger ones covered with a loose sheath  
seeds with a comparatively large albumen, <sup>opercule</sup> <sup>placenta</sup> <sup>seeds</sup> <sup>forming</sup>  
a very hard skeleton. South parts of the U.S. & Mexico.

2. *Clavaria* species without sheath, generally smaller  
I mostly compressed, seeds like those of last, growth  
low, without a solid skeleton as in the same region  
as the last, perhaps also in S. America.

3. *Pachysperma*, species without sheath, *ternstroemia*  
compressed, often very flat & flexible. Leaves often somewhat  
persistent; seeds thick in proportion; ~~both~~ <sup>both</sup> very small  
or scarcely any albumen, wood unknown; growth tall  
or low and prostrate. South America. I could study  
only *Op. subulata*, *cylindrica* & *viridula* of the section



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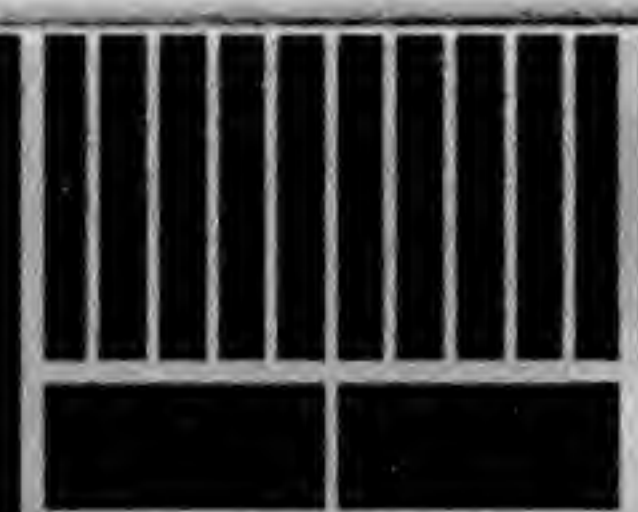
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*O. salmiana* probably also belongs here and the different  
 SW and NW *Quercus* classes <sup>as</sup> *Ovata*, with also  
 the *Platanus* <sup>with the same</sup> ~~remains~~ <sup>be seen when the</sup>  
~~fruits~~ <sup>become</sup> ~~in~~ brown.

*Argemone*

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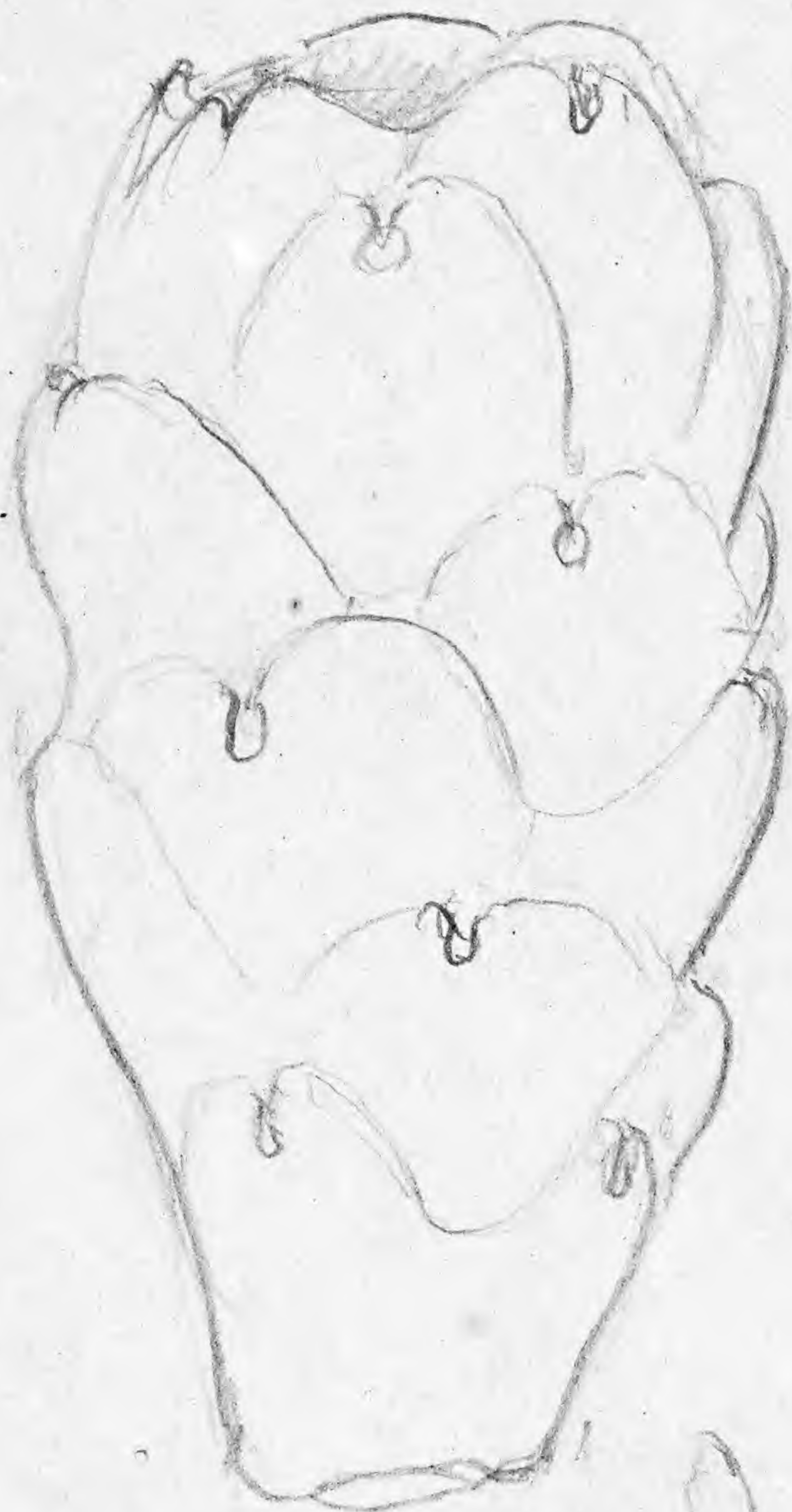
*Opuntia subulata*

15 March 1883

Thomas Hanbury, Palajo Orango, Mortola  
near Mentone

Febr 1883

young fruit  
sterile, only  
abortive



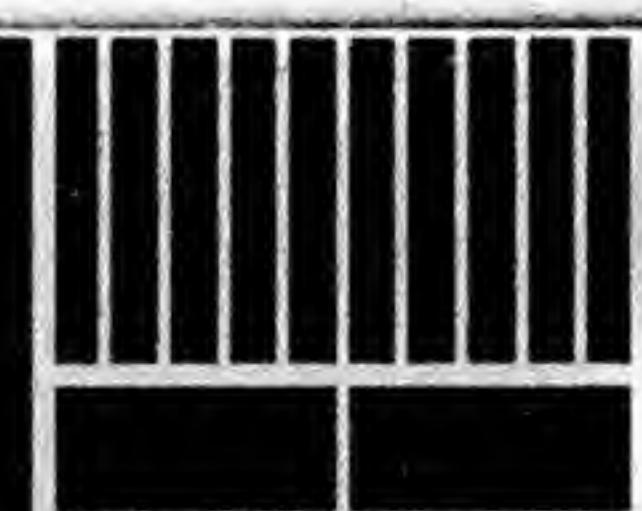
$\frac{7}{11}$



flower bud



$\frac{8}{13}$



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Opuntia subulata

Thorned cholla

1892

Jan 10



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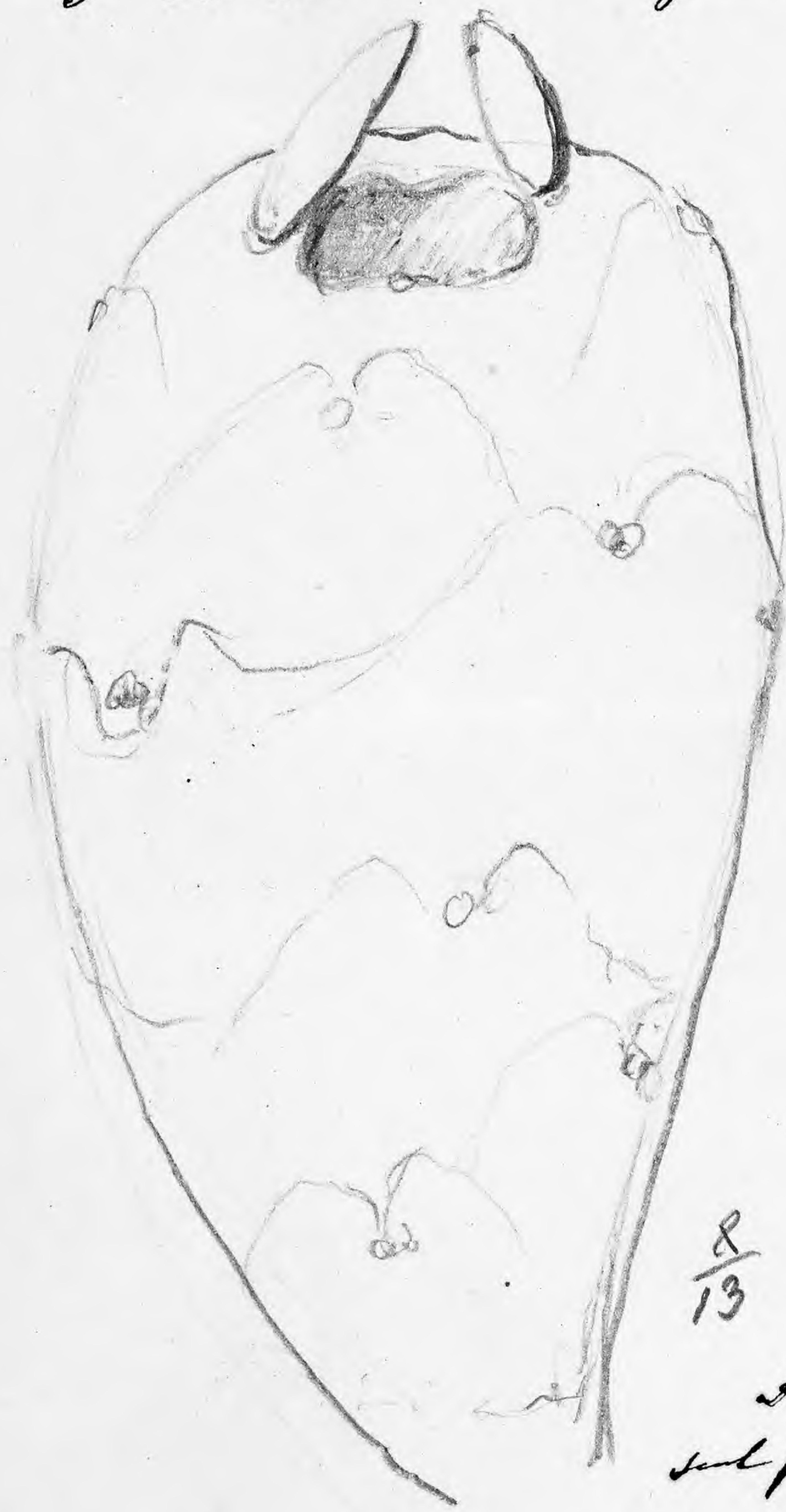
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About 20 areolae on fruit in  $\frac{7}{11}$  order  
 for almost drop det 11  
 tubercles somewhat rhombic, flat, only slightly  
 prominent, notched at top, with the areola  
 deeply immersed, below and continuous with  
 the notch

In the bud purple? oblong-  
 with a few pointed petaloid sepals rounded petals number 8  
 5 erect thin stigmata



$\frac{8}{13}$

April 20<sup>th</sup> 1893  
 sent fresh by Mr. Harburg

fully grown but not mature  
 18 large seeds, densely packed  
 All the ovarian sepals dropped, except a few on top  
 umbilicus narrow and deep; fruit green, flesh thick  
 and yet hard.  
 fruit 4 in long  $2\frac{1}{4}$  in thick



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April 20 1893  
and part of the morning

My dear Mr. Engelmann

I have just received your letter of the 19th inst. and am glad to hear that you are well. I am well and hope this letter finds you the same.



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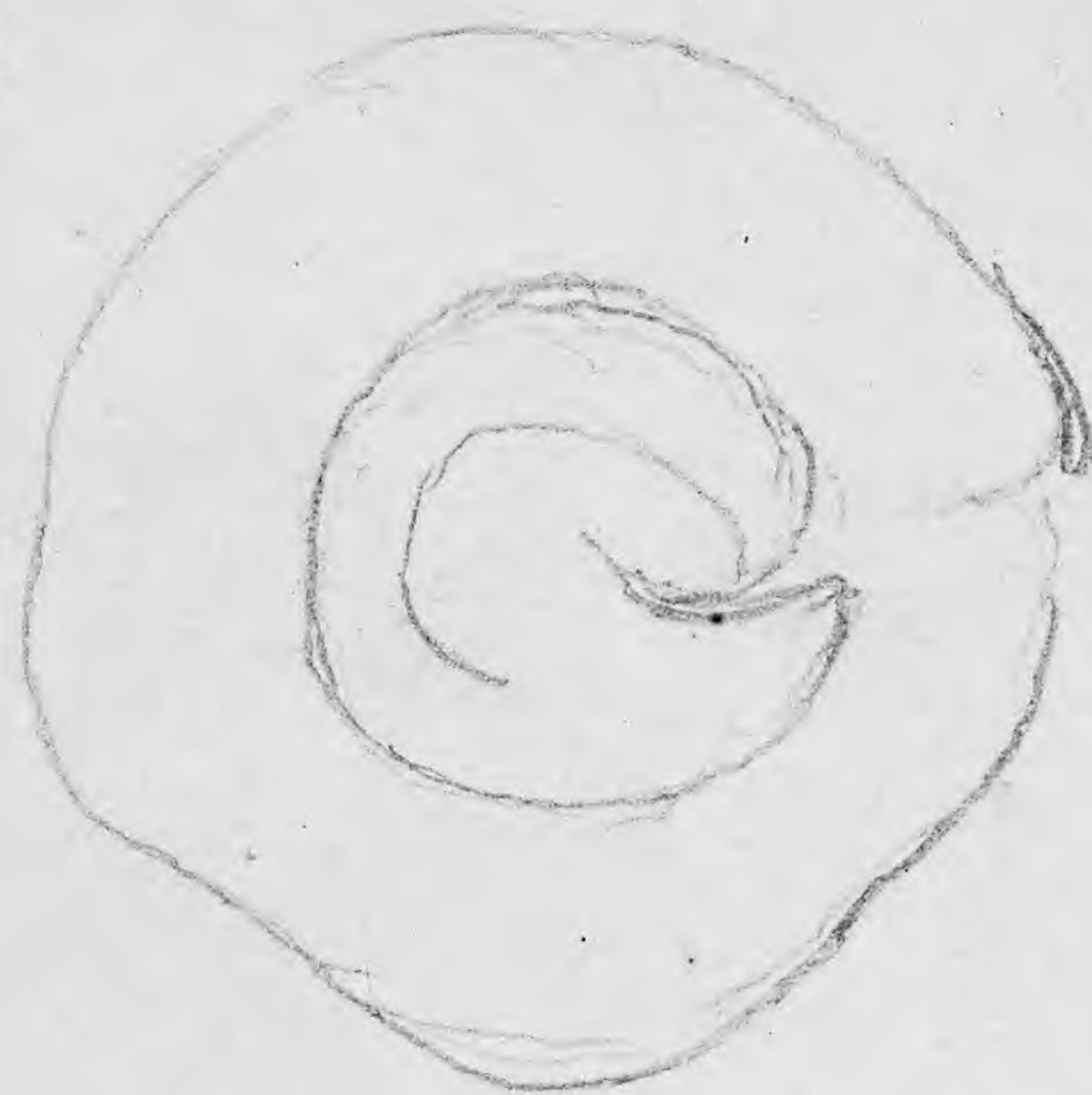


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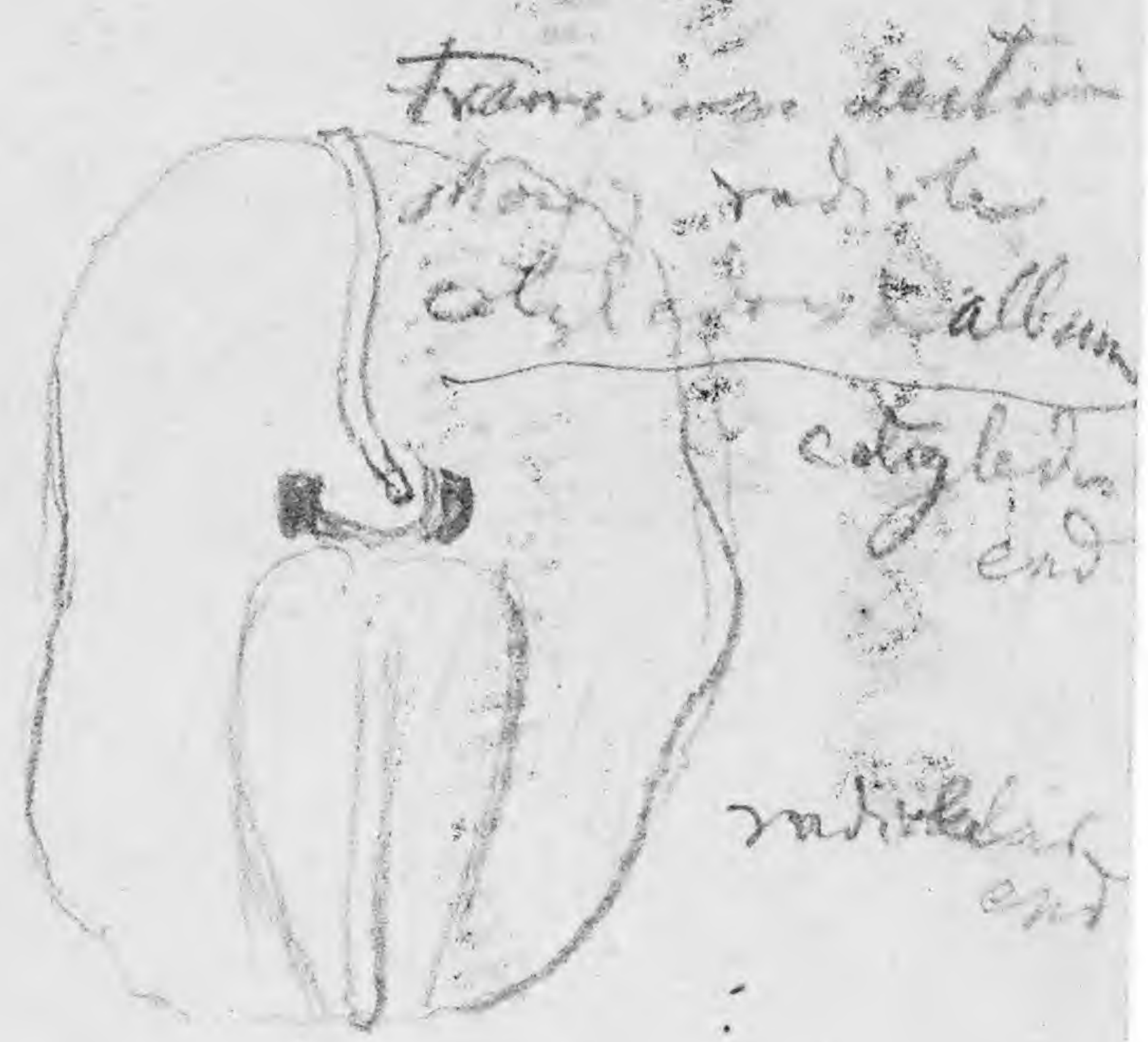
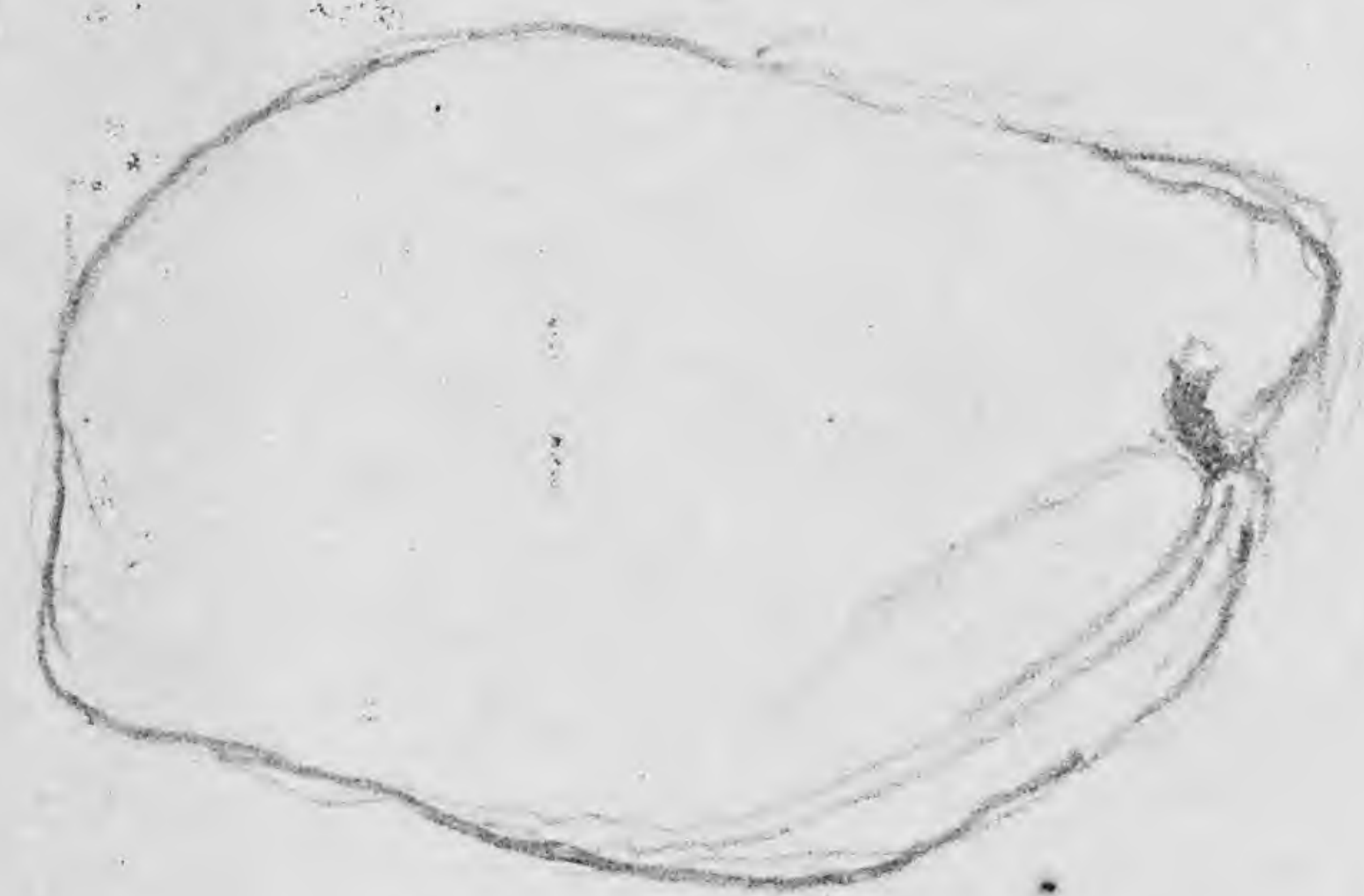
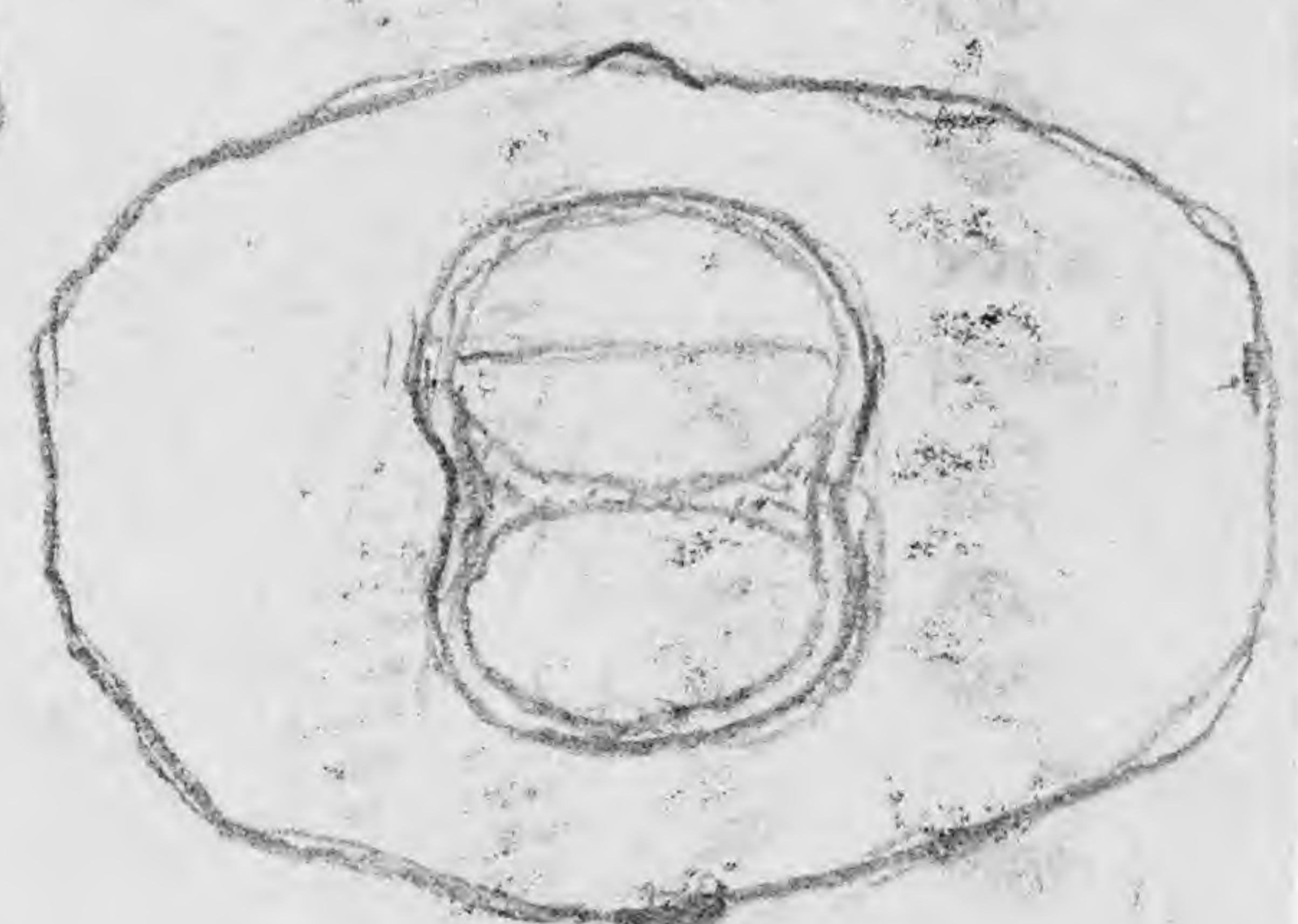
*Opuntia subulata*  
mentone

April 23 1883

x4



a flattened seed  
commisura



transverse section  
showing radiate  
cotyledons & albumen  
cotyledon end

radicle end

back of a seed

ventral side

seeds irregular  
8-12 mm diam  
Commisura filiform



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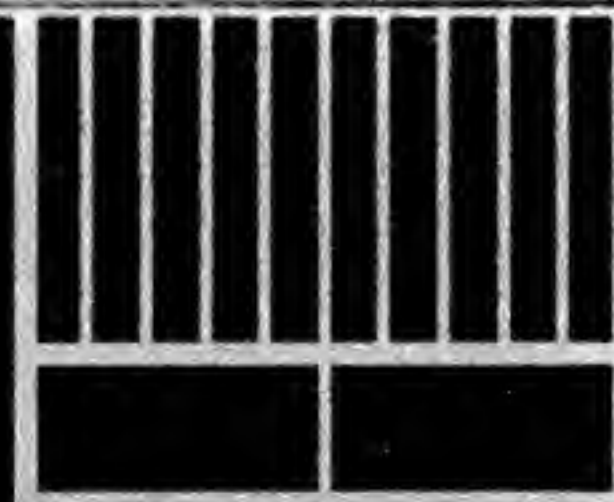
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**Leitch & Corlies**

**DRUGGISTS**

*South West  
Corner Fifth  
and Market  
Streets.*

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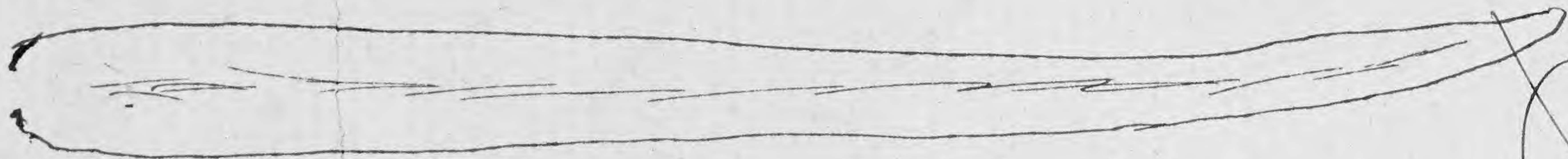
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*Picroseria subulata*, Hort Dyck Aug 1857  
has leaves 3-5 inches long, subulata, sublerate, but  
flattened and channeled on the upper side



In Hort Kew the spines are often 2-2 1/2 inches long, few and a bunch  
yellow, with the tendency to recurved barbed epidermis, cells,  
approaching therefore Opuntia.



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Nov. 12, '87.

for the  
hostals of the

utallin "fooled"

it is a larger

and grows

in woods

and as it is

then dry prairies.

saw it there,

hardly now

and in every

perhaps, Co. La.

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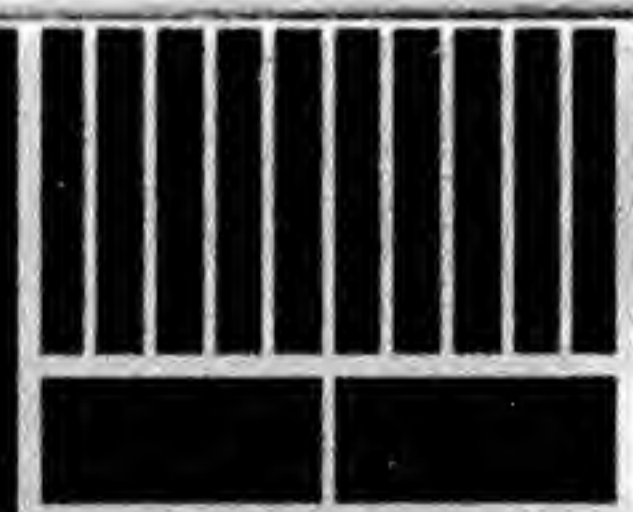
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Seuke's Garden Sept 3. 1857

Pereskia subulata — 2-3" in diameter,  
6 feet high, beautiful branching plant,  
lower part of stem covered with furrows  
of dark straight spines. exactly like  
those of P. Bleo, — at Hoch's, Cologne



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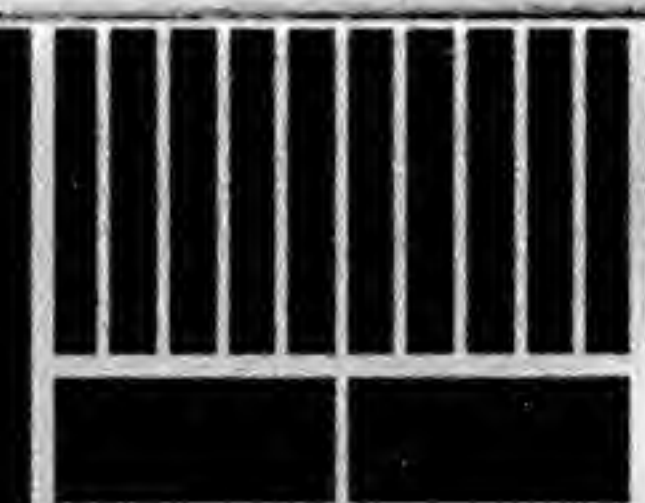
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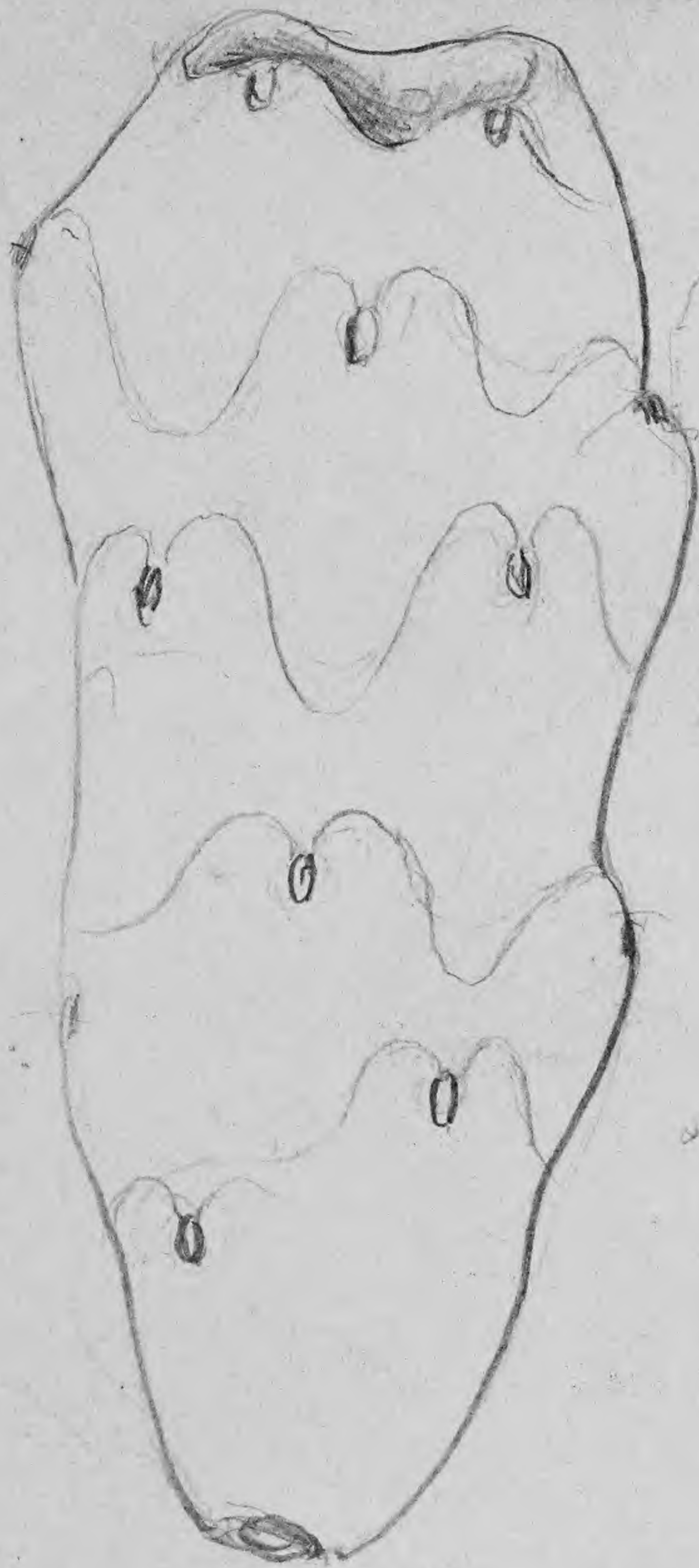


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*Opuntia subulata*  
green fruit from Hb. Palermo

March 13 '79

A. Todaro m.  
Feb 1879



6 long, round  
stigmata for base of  
ovary  
style 8" - 12-14 mm  
long



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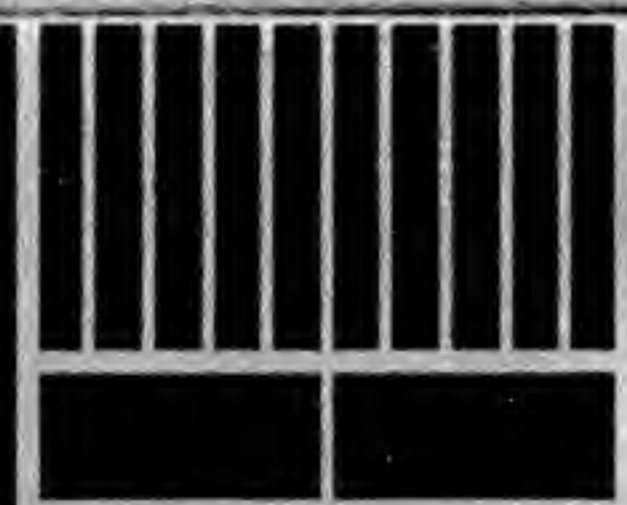
No. 3003 Locust Street.

Geo. Engelmann, M. D.,

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*GE*

No. \_\_\_\_\_ Date, \_\_\_\_\_ 187



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*Opuntia* (*Peiresia*, Kunze) *subulata* miki

Hort Cels, Paris March 18

1869

young white  
wool, with a  
new spine

form of

*pulvinus*

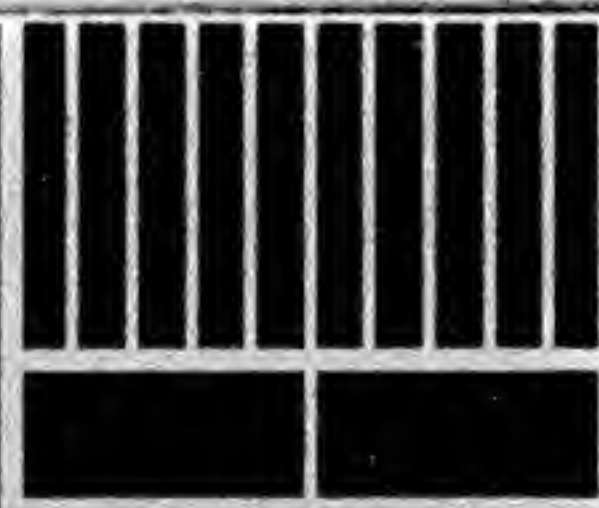
on old trunk

obovate  
flat

leaf

a stout plant, 5 feet high -  
spines with strong barbs, there-  
fore an *Opuntia*, no *Peiresia*.  
The persistence of the leaves is  
no character. Though rare, it  
does occur in some cylindric *Opuntia*, and  
very remarkably so in *O. Verschaffeltii*, CG, where  
the leaves persist the whole season.

Trunk 2 ribs distinct, green, with flat obovate  
*pulvilli* or *tubercles*; — number of spines increasing with  
age



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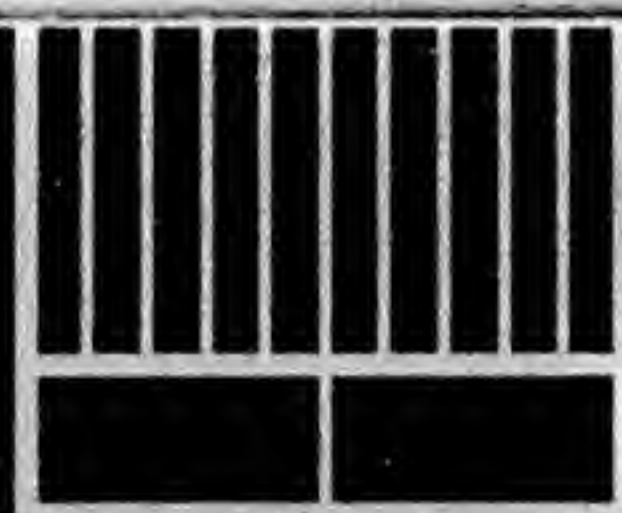
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